Memorandum

Date: 15 July 2002

To: File

From: DPV

Comm.: 22036.00 – WTC

Subject: World Trade Center Fire Protection System

1.0 Fire System

The fire system was fed by two 8-inch fire loops located in the Concourse and in Level B-1 ceilings, with Siamese connections located on the exterior walls for use by NYFD.

The fire protection system for One-WTC was comprised of the following components:

- Four fire pumps
- Four fire reserve tanks — Booster on 9th floor

The fire protection system for Two-WTC was comprised of the following components:

- Three fire pumps
- Three fire reserve tanks

2.0 Sprinkler System

The sprinkler system distributed water from 14 holding tanks; the tanks had a total capacity of 70,000 gallons and were automatically refilled from 2-inch connections. The primary water supply consisted of connections to 12-inch city mains as well as the water retained in the tanks. Water was distributed by 12 pumps through three down risers in each of the towers, one riser per zone. Riser A served floors 110 to 99, Riser B served floors 98 to 32, and Riser C served floors 31 to 1. The C risers were interconnected through a divisional control valve to permit isolation in the event of impairments. Additional divisional/isolation valves were located on floors 1, 15 and 67 of One-WTC and floors 1, 15 and 77 of Two-WTC. The sprinkler systems for Four and Five WTC were separate from those for the towers.

The sprinkler system for One-WTC (a.k.a. – North Tower, Tower A) was comprised of the following components:

- The 110th floor had a 5,000-gallon combination sprinkler/standpipe tank.
- The 110th floor had a 10,000-gallon tank that served Risers A and B.

- The 108th floor MER contained a 30HP, 500GPM Peerless sprinkler pump serving the sprinklers on floors 99-107 and standpipe floors 99-Roof. The pump was served by a 5,000-gallon tank (location undetermined).
- The 75th floor MER contained a 5,000-gallon tank and a sprinkler pump (3-stage, Peerless rated at 750GPM).
- *The 42nd floor had a 5,000-gallon combination sprinkler/standpipe tank.*
- *The 41st floor had a sprinkler pump (3-stage, Peerless rated at 750GPM).*
- *The 41st floor had 5,000-gallon tank that served sprinklers from Riser C and the standpipe system.*
- The 7th floor had a sprinkler pump (3-stage, Peerless rated at 750GPM).
- The B-1 level had a sprinkler pump (3-stage, Peerless rated at 750GPM) that pressurized the Subgrade, Concourse, and Plaza building sprinkler systems.
- The Subgrade was served by downfeed risers from the B-1 loop.

The sprinkler system for Two-WTC (a.k.a. – South Tower, Tower B) was comprised of the following components:

- The 110th floor had a 5,000-gallon combination sprinkler/standpipe (fire reserve) tank serving the standpipe risers.
- The 110th floor had a 10,000-gallon (fire reserve) tank that served Risers A and B serving the sprinklers on Floors 33 to 108.
- The 108th floor MER contained a 30HP, 500GPM Peerless sprinkler pump serving the sprinklers on floors 99-107 and standpipe floors 99-Roof. The pump was served by a 5,000-gallon tank (location undetermined).
- The 75th floor MER contained a 5,000-gallon tank and a sprinkler pump (3-stage, Peerless rated at 750GPM).
- *The 42nd floor had a 5,000-gallon combination sprinkler/standpipe tank.*
- *The 41st floor MER contained a 5,000-gallon fire reserve tank that served sprinklers from Riser C and the standpipe system.*
- *The 41st floor had a sprinkler pump (3-stage, Peerless rated at 750GPM).*
- The 7th floor had a sprinkler pump (3-stage, Peerless rated at 750GPM).
- The B-1 level had a sprinkler pump (3-stage, Peerless rated at 750GPM) that pressurized the Subgrade, Concourse, and Plaza building sprinkler systems.
- Standpipe/firehose racks were supplied by 300HP, 750GPM pumps on Level 294 and in the 7th, 41st, and 75th floor MERs.
- The Subgrade was served by downfeed risers from the B-1 loop.

The sprinkler system for the other areas of the complex (Subgrade levels B-1 to B6, Concourse, Northeast Plaza Building (NEPB), and Southeast Plaza Building (SEPB)) was comprised of an entirely separate fire protection system with the following components:

- Level B-1 had two separate, 1500GPM Peerless pumps. They were fed by 12-inch connections to city mains and supplied the sprinkler systems of the NEPB, SEPB, Concourse level, and the 6 Subgrade areas.
- There were two 8-inch loop mains, with isolation valves, serving these areas. One loop main served sprinkler risers going down to the Concourse and Subgrades; the other loop main served up risers into the NEPB and SEPB.

3.0 Fireproofing Upgrade

6-April-2001. Reference was made to UL Guideline G508. The guideline presents a design for a 1.5-hour restrained assembly fire rating a 1-hour unrestrained assembly fire rating. This UL design was referenced in "Schedule 6.2.2" entitled "Deferred Repair Obligations" in a memo by Chi Chu of Silverstein Properties, dated 6-Apr-01, addressed to Sheldon Pride of Property Solutions. The memo indicated that it was the policy of the PANYNJ to upgrade steel fireproofing to 1.5 inches thick based on UL Guideline G508. The memo is identified by Bates Numbers SILV-52 000673 to 000723; the reference to G508 appears on sheet 000675. Note that G508 assumes a 2-inch thick normal-weight concrete floor deck over a ⅜-inch rib, while the Merritt & Harris property condition assessment indicated that the typical office story floor has a 4-inch thick light-weight concrete floor slab over a 1½-inch deep metal form deck (see SILV-65-000605 for the North Tower and SILV-65-000089 for the South Tower).

6-December-2000. The executive summary of the Merritt & Harris property condition assessment of the World Trade Center Portfolio indicated that "[a]n ongoing program of re-fireproofing the structural steel to the full thickness for 2-hour [fire] rating [was] in place" and was being "done on a lease rollover basis whenever there is a full floor of space being built out for new occupancy." See SILV-65-000537.